A NOTE OF WARNING.

LESSONS TO BE LEARNED

FROM THE

CHOLERA FACTS

OF THE

PAST YEAR,

AND FROM

RECENT CHOLERA LITERATURE.

BY

ELY McCLELLAN, M. D.,

SURGEON UNITED STATES ARMY.

FROM THE DECEMBER NO. RICHMOND AND LOUISVILLE MEDICAL JOURNAL.

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As the Author was unable to read proof he asks attention to the following—

ERRATA.

Page 3 line 3 for cholera, Asiatic, read *Cholera Asiatica.*
p. 4 line 14 for foci read *focus.*
p. 5 line 12 for infliction read *infection.*
p. 11 line 10 for we read *they.*
p. 11 line 17 for prediction read *suggestion.*
p. 21 line 5 for as a christian read *or a christian.*
p. 21 line 15 and 16 omit words *those of.*
p. 22 line 12 for few roads read *three roads.*
p. 22 line 19 read, no other clothing either by day or night.
p. 26 line 7 for ablutions read *ablution.*
p. 36 line 5 for refutes read *refute.*
p. 37 line 1 for of read *with.*
p. 37 line 24 omit the word *who.*
p. 39 line 24 for were read *was.*
p. 39 line 3 for Lent read *Tent.*
p. 41 line 3 for word such read *greater.*
p. 42 line 22 for of Thudichum read *by Thudichum.*
p. 42 line 23 for his read *this.*
p. 43 line 1 for indicates read *indicate.*

With the Compliments

OF THE AUTHOR.

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ASIATIC CHOLERA.

During the past eighteen months, the English, Indian and Continental sanitary observers have recorded outbreaks of cholera, Asiatic, in various portions of India and Turkey in Asia. Such records have their significance as indicating the gradual approach of cholera (A.)* to Europe. As such they are accepted by European sanitarians, and it is time that American authorities should shake off the lethargy which in former years has permitted this disease to enter and to devastate this continent, and by the judicious employment of those methods which science has placed within their grasp to prohibit the importation of the disease.

The time has surely come when American physicians should carefully study the innumerable facts which have been gathered of the movements of this fatal disease throughout the world, to base their *theories*† upon these facts and not upon *hypotheses*‡ which they may have been taught. It is therefore proposed in this article to gather together all the cholera notes which have appeared during the years 1875 and 1876, and to present them with some notice of recent cholera literature and remarks upon the great truths therein contained, for the consideration of such professional men as may be interested in this study.

CHOLERA ASIATICA IN SYRIA.

Early in 1875 cholera (A.) was reported to have become epi-

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* Cholera Asiatica.

† A true theory is a legitimate deduction from many facts, not contradicted by equally numerous and equally well attested facts. *An hypothesis is an idea or supposition or conjecture, which* remains to be proven.—*Peters.*

A theory is founded on inferences drawn from principles which have been established by evidence.—*Fleming.*

‡ An hypothesis is a guess or supposition made concerning the cause of some particular fact, with the view of trying experiments or making observations to discover the truth. A theory is a complete system of suppositions *put together for the purpose of explaining all the facts that* belong to one science.—*Taylor.*

demic in Syria, and Dr. George E. Post,* surgeon to Saint John's Hospital at Beirût, reports such facts as could at the time be gathered as to the epidemic.

"The disease first developed at Hamath, a Turkish town of some 50,000 or 60,000 inhabitants, in the person of an Albanian recruit, some 500 of whom had recently been received at the garrison. These recruits are reported as being in bad sanitary condition at the time of their arrival, but there was nothing to excite suspicion that any of them had been exposed to cholera (A.) infection.

"On the 22d of March a case of cholera (A.) occurred in the person of one of these recruits, and it was soon followed by 15 others in the garrison; of these 16 cases, 15 proved fatal. From the foci thus established at the barracks the disease spread to the town.

"From Hamath a detachment of troops were sent to Damascus. They carried the disease with them, and soon all the villages along the line of march were infected. Early in June the disease developed in Damascus, a panic occurred. The inhabitants scattered in all directions, and carried the disease to Lebanon and anti-Lebanon, points which had in other epidemics proved safe asylums from its ravages. July 5th a woman of Damascus arrived by Diligence at Beirût. Two days after her arrival she died of cholera. This case and probably others which followed, established 'foci' of infection at that town, but the disease did not become epidemic until seven days after the first case had died."

As yet but fragmentary notes of this epidemic are at our command. We quote from the "Lancet" and the "Medical Times and Gazette."† From these journals we learn that the Syrian authorities were at first disinclined to acknowledge that the disease at Hamath was cholera (A.), and it was not until the disease had become virulently epidemic that any steps were taken to investigate the outbreak and the condition of the suffering communities. Such, unfortunately, is the early history of almost all epidemic diseases of a virulent character. Local authorities almost invariably attempt to cover up the existence of infectious diseases, in the vain hope that by so doing the

* Lancet, London Edition, August 28, 1875. Dr. Post is the distinguished son of Dr. Alfred C. Post, of New York City.

† The London editions of both journals alone used.

financial prosperity of the infected locality may not be disturbed. Such events have but lately transpired upon our own shores. It was known for some time that yellow fever was virulently epidemic at the Havana. Vessels with passengers, crew and cargo, were constantly arriving at ports of the United States, and one morning a case suspiciously like that disease occurred in the city of Savannah. Prior to the occurrence of this case, one or more infected vessels had arrived at that port. The first case was rapidly followed by others, the mortality each day increased, and still the very existence of the disease was held *as a state secret.* Finally the explosion occurred, the fact could no longer be concealed, the infliction spread over the city. Those of the inhabitants who possessed the requisite means left the place, and the daily telegraphic reports announced the death of many refugees, some as far north as New York city. Had the importation been cholera in place of yellow fever, many points of infection would have been established, and by this time an epidemic would have been established.

To return to the Syrian outbreak. On the 24th of July it was reported that Dr. Dillon, the resident sanitary officer of the Turkish government at Mossul, had been sent to Hamath; but, unfortunately, on the fourth day after his arrival he was taken with cholera (A.) and died. August 14th it was reported that Antioch, Salahich, Deir Ali, were infected, and that the disease had become epidemic among the Druses. September 18th the disease was reported at Aleppo, Tripoli, Beyroût, Lattakia and Sienket Haibe in the Lebanon. October 30th it was stated that cholera (A.) had greatly abated in Syria, but on the 18th of December it was prevalent at Kirsada and Insi Mossul.

With these notes the record of the Syrian outbreak closes. A commission of experts are, however, upon the ground; all events will be thoroughly sifted and subjected to a rigid examination, when it will undoubtedly be found that this demonstration of the disease has in no way departed from those already on record.

A leading article in the "New York Times" upon this subject is of interest, as throwing some light upon the circumstantial evidence which already surrounds this demonstration:

"No great Asiatic pestilence has ever scourged the East or Levant and allowed Damascus to escape. At least two great caravans, the pilgrimage of Hadjis from Bagdad and the great commercial caravan from the same region, have for centuries made the plain of Demeshk-i-shem their terminus, and these caravans carry pestilence in their train under any and every quarantine which European skill can devise and Turkish administration execute or attempt to execute. It was by this ready path that the plague entered Palestine when the troops of the French Directory occupied it, and entered it again under Napoleon's sedulous imitator Ibrahim Pasha, thirty years later. The great commercial caravan this year (1875) would have reached Damascus, in the usual course of events, shortly before the breaking out of the cholera whose devastation is just announced, and it will not be surprising if later advices prove the caravan to have been its source, as present news places its beginning on the caravan route."

Hamath is north of Damascus a little over one hundred miles, but is upon the great route of travel to and from that city. It is as yet impossible to account in detail for this outbreak of cholera, although the route by which the infection would probably again reach the eastern shores of the Mediterranean and Russia was last year indicated by Dr. Peters.*

Although from Hamath the spread of the disease (from the foci therein established) over Syria is clearly demonstrated, Dr. Post rather inclines to the belief that it was an *endemic outbreak*. The untimely death of Dr. Dillon will probably prove an obstacle to the development of the initial facts of this demonstration, but developed they will surely be, possibly before these pages issue from the press.

It is, however, perfectly allowable for us to judge this outbreak by the history of former epidemics, and a recent communication of Dr. James McCraith,† Surgeon to the British Seamen's Hospital of Smyrna, entitled "*How the cholera got into Salonica and was carried out again without accident*," is certainly suggestive as regards this outbreak.

"Salonica is a walled Turkish town, open only at the sea entrance. At this town during each epidemic of cholera, the surveillance exercised is said to be extreme. In 1865 the

* Cholera epidemic of 1873 in the United States, p. 689.

† Medical Times and Gazette, December 11, 1875.

quarantine establishment of the city was removed to a long distance on the coast, and at this establishment some fifty or sixty fatal cases of the disease occurred.

"During the height of the disease at the quarantine, the inhabitants of Salonica were startled to learn that cholera (A.) had occurred at a small village but one hour's distant, with which the city was in free pratique, and that several cases had proved fatal. Immediate investigation followed, and it was proven that the head of the family in which the disease had first occurred had a few days previously visited Salonica to purchase supplies; that while in the city he had purchased a '*grego*' or great coat, made of goats' hair, from a man who had been employed at the quarantine, but who by some means had gotten into the city; and it was positively determined that this coat had belonged to a man who had died of cholera (A.) at the quarantine."

Dr. McCraith remarks, that Salonica was saved from the disease by the merest accident, for had the *grego* been sold in the Jew quarter of the city, an epidemic undoubtedly would have been developed.

CHOLERA IN INDIA.

Immediately preceding this outbreak in Syria, there had been no unusual activity of cholera (A.) in India. It must, however, be remembered that in certain portions of the Indian Empire (the Presidencies of Bengal, Bombay, and Madras, and notably only those portions of these Presidencies that lie upon the coast) the disease is *endemic;* that each year there are two or more outbreaks of the disease. The hill country is comparatively exempt from the disease; yet to this, in these later years, there have been marked exceptions, as will be hereafter shown. That the disease was by no means quiet, however, is shown by the report of Dr. Henry King,* the Acting Sanitary Commissioner with the Government at Madras. This report shows that in a population of rather more than 31,250,000 inhabitants there were, in 1875, 87,943 cholera deaths.

The Indian reports for the period of which we are treating also indicate a startling advance of the disease. The hill stations, the Sanitaria, can no longer be considered as health re-

* Medical Times and Gazette, March 25, 1876.

sorts, and this not from any fault of their location, but simply from the indifference of the local authorities, who have permitted, year after year, the simplest sanitary laws to be disregarded. It would seem as if these same authorities had been determined to demonstrate, beyond a peradventure, the *truth* that cholera (A.) can be carried wherever man may wander; and that the disease may be propagated in any locality, no matter how far removed it might be from *malarial* or *telluric influences.*

Simla, the summer seat of the Government of India, is located in the Himalayas, to the north of Hurdwar, upon the northern borders of the Punjab, at an elevation of 7,000 feet above the sea, and distant from Calcutta over a thousand miles of travel. It is acknowledged to be the most beautiful hill sanitarium in the world. It formerly consisted of but Peterhooff, the summer residence of the Viceroy, the establishments of other officials and their dependants; but it would now appear as if the sanitary authorities were satisfied "with the pureness of the mountain air as a safeguard against the diseases of the plains; for on the face of every hill houses are piled one above the other from the bottom to the top, and thus the drainage from the uppermost houses saturates and poisons the soil around those below them. In the very centre of the station, in the worst possible site that could have been selected for it, is placed a foul and crowded native bazaar. The principal thoroughfare leads through this bazaar, and every one passing along it is exposed to the malarious vapors which such a locality must needs generate."*

Since 1865 cholera (A.) has almost yearly appeared at Simla in a deadly form, and it must be accepted as a very strong argument that the disease will occur and develop its virulent power wherever it may be carried by human agencies, and wherever it finds, when so conveyed, a suitable nidus. Further evidence that this sanitarium has been destroyed by human agencies alone is found in the report of the Sanitary Commissioner with the Government for India in 1865.†

* Medical Times and Gazette, Nov. 6, 1875.

† Proceedings of Sanitary Conference of Bengal, 1875.

"The sides of the hills were everywhere studded with human excrement, and the smell which arose in every direction was a disgrace to a place which professes to be an asylum for the sick; the water was contaminated. In summer the dry beds of the mountain torrents are places of convenience and filth. The edge of the hill, at a few yards distant from the public road, was lined with filth, and was evidently the resort of the numerous native servants of the locality. At some distance lower down the slope is the spring from which the water supply of the summer residence of the Viceroy and many of the largest and best English houses in the vicinity is drawn. What must occur after every rainfall is but too obvious."*

The "Medical Times and Gazette" of October 23, 1875, notes the fact that the Sanitary Commissioner has advised the abandonment of Simla for the next three years, and the removal of the summer seat of Government to Raneekhet.

At the same date that the outbreak of cholera (A.) of 1875 was reported at Simla, the disease had become epidemic at Kuscuolie, the latter also a sanitarium. This is a point of interest to cholera students, as it is the locality at which Pringle† was able to determine the way in which the Cordon-de-Santé had been broken in 1872 and the station infected by cholera. Pringle traced the epidemic of that year to a cow-feeder who returned to the sanitarium after a visit to some infected villages upon the plains.

October 2, 1875, cholera (A.) was reported to have broken out amongst the European garrison at Delhi.

May 15, 1876, the disease was reported to be spreading through Cashmere.

August 5, 1876, cholera (A.) is again reported at Simla and at Darjuling and Murree.

It will be observed that the reports we have noted relate to the "up country" stations of India. No note is made of the violent outbreaks of the disease near the coast, especially those in the Presidency of Bombay, although they are the undoubted starting points of these epidemics. Persia and the remaining Asiatic States remain to be heard from, when the advance of a

* Macnamara, Treatise on Cholera, p. 262. Macnamara, History of Cholera, p. 397.

† Edinburgh Medical Journal, Sept., 1874, p. 231.

new epidemic for the nations of the western world may be announced, and its progress, step by step, may be mapped out.

Without further comment upon these facts, we pass to the consideration of certain valuable additions to cholera literature which have been issued during the present year. The works to which we refer are from the hands of gentlemen whose names are familiar to all students of the disease, and who are received as authorities upon this subject by the vast majority of readers.

I. *Reports of the Medical Officer of the Privy Council and Local Government Board. New Series, No. V. Papers Concerning the European Relations of Asiatic Cholera, Submitted to the Local Government Board in Supplement to the Annual Report of the Present Year. London.* 1875.

II. *A History of Asiatic Cholera, by C. Macnamara, F. C. U., Surgeon to the Westminster Hospital. London. Macmillan & Co.* 1876. *8vo., pp.* 466.

III. *Cholera Epidemics in East Africa; an Account of the Several Diffusions of the Disease in that Country from* 1821 *till* 1873, *with an Outline of the Geography, Ethnology, and Trade Connections of the Regions through which the Epidemics passed. By James Christie, A. M., M. D., late Physician to the Sultan of Zanzibar. London. Macmillan & Co.* 1876. *8vo., pp.* 508.

The first volume which we notice is the last of that most valuable series of reports on Public Health, published under the supervision of Mr. John Simon, who has been for many years, as is known to all, the Medical Officer of the Privy Council.

The attention of the sanitary authorities of Great Britain having been turned to the examination of the two last cholera (A.) epidemics in Europe, the task of collecting and of presenting the evidence obtained was assigned to Mr. Netten Radcliffe, who is known as a careful and accurate sanitary observer, who has especially interested himself in the study of cholera (A). As to the manner in which this task has been performed, we can but quote the introductory remarks of Mr. Simon:

"All the facts point to a single conclusion as to the spread of the disease—namely, that human intercourse is the single active factor in diffusing the infection. Detailed observation of par-

ticular outbreaks of cholera and suggestions of analogy and experiment have long led European pathologists to believe that the disease possesses great, though peculiar, power of spreading from the sick to the healthy; and Mr. Radcliffe in his very wide epidemiological study finds no reason to impute to cholera (outside of India) any other mode of origination and extension than such as that doctrine expresses."

Sanitary students have long been under obligations to Mr. Radcliffe for original experiments, plainly expressed opinions, and invaluable suggestions. To him we are indebted for the first steps which led to the observations from which the work, third upon our list, was formed.

Radcliffe, in 1865, directed attention to the occurrence of cholera (A.) upon the slave dhows running north and captured off the coast of East Africa previous to the cholera (A.) appearing in the Hedjaz, and he suggested that the disease must have existed in East Africa at that period. This prediction has now become a fact. In this report Mr. Radcliffe has adopted the form of a narrative of facts, and these facts all point but to a single conclusion as to the spread of the disease, and that *is that human intercourse is the single active factor in diffusing the infection.*

As regards the question of quarantine, which has for years been a vexation to sanitarians, Mr. Simon, in consideration of all earlier data, and the later facts presented by Mr. Radcliffe, remarks:

"That a quarantine of a sort to be trusted in as a national defence is not conceivable, except in proportion as a people live apart from the great highways of commerce, or are ready and able to treat their commerce as a subordinate political interest; that though undoubtedly quarantine planned with the precision of a scientific experiment and conducted with extreme rigor, may keep cholera out of places (such as remote islands) where the extremely difficult conditions can be completely fulfilled, yet, under other circumstances, quarantine can not reasonably be expected so to succeed, and must be regarded as a mere irrational derangement of commerce. Seeing that cholera is diffused in all directions by means of constantly moving streams of religious pilgrimage and commercial enterprise, the first condition of treating a contagion so distributed would be to 'immobilize' at discretion the great tides of human intercourse; a manifestly impossible project."

Later, he writes: "It can not, I think, reasonably be doubted but that, as conditions of filth, and especially as filthy conditions of water supply are the main facilitating conditions for the dissemination of cholera in Europe, so they must be immensely potent influences in favoring the advance of cholera from station to station in successive epidemic outbreaks in the countries which lie between India and Europe; and it would seem certain that, along the whole succession of lands which transmit the streams of westward traffic from India, common hygienic vigilance in respect to those conditions may be of very great effect in impeding the diffusion of cholera."

Macnamara, for many years was Surgeon to the Calcutta Ophthalmic Hospital, and during the entire period of his residence in India was a most enthusiastic cholera student. In 1870 he published a treatise on Asiatic Cholera; a work noted for the clearness of the testimony offered and for the boldness with which his deductions were advanced and defended. He is known as an exponent of that *thoroughly practical theory* which claims that cholera (A.) is a disease of human beings, which is carried from place to place *"through a continuous chain of individuals affected with the disease or through articles stained with their dejecta."* This theory, which has enlisted the entire sympathy of the most distinguished cholera observers of the world, offers (should its premises prove to be true) the only means of escape which communities exposed to the infection of the disease may avail themselves of.

For should the disease be conveyed by an epidemic wave of some mysterious oscillating material which is influenced by telluric or meteorological disturbances, what steps may be taken against it? Or, should the disease originate in that wonderful atom termed malaria, supported by local influences, such as filth, etc., the only remedy to be found is in the herculean task of removing from the face of the earth all decomposing matter which may engender malaria.

Upon either proposition it is fruitless for communities to hope that they may guard themselves. Better than indulge in so vain an effort whenever cholera occurs, they should adopt the legend of the dark ages and write upon their walls "the visita-

tion of God." Fortunately, we are not called to bow to such blind theory and to submit to be led to the slaughter. The same mighty power that let loose this dread disease has also appointed the way of escape. By exercising the intellectual powers which they received from their creator, Snow, Farr, Simon, Budd, Peters, Macnamara and others have elaborated this *practical theory*, supported by an indisputable array of facts, and this theory places in the hands of all communities the means of guarding against the disease.

Cholera (A.) is not a contagious disease, per se, but when the excreta of a person suffering from the disease have reached a certain stage of decomposition (or, as a late writer put it, of development) it becomes infectious and is capable of reproducing the disease, is the argument which is advanced, and to prevent the excreta of such cases reaching this stage is the remedy offered.

Within the compass of Macnamara's work will be found a comprehensive, but of necessity condensed, narrative of the travels of cholera (A.) from the times of Vasco di Gama to the present. Such an array of truths are presented as must convince the most skeptical, provided they will allow the immensity of the facts, gathered from the entire range of cholera history of all nations, to drive from their minds some isolated instances of individual experience in their native villages, which have hitherto obscured all else from their eyes.

It is very true that in detail Macnamara has been telling again the same old story, and that perchance it may not have been told in any more appealing style than that adopted by others, yet the *facts* not *theories* advanced will be forever duplicated by cholera (A.) epidemics, and each outbreak will more clearly demonstrate the assertion *that no epidemic of cholera (A.) has ever occurred in Asia, Europe, Africa or America, without leaving a broad trail, by means of which it may be traced back to its point of eruption in British India.*

We are accustomed to hear it stated in this country that the government of India has produced the best practical workings the world has ever known. Nothing can be more fallacious than this statement; and *that* which has been hinted at by

former authors is by Macnamara most strenuously insisted upon. It is a surety patent to all fair-minded students that cholera (A.) originates alone in India, and that the entire civilized world has a right to demand that all necessary measures be taken by the government of that country to prevent the escape of the disease from their borders; and it is still more true that while under the auspices of this Indian Government much has been *written* upon sanitary improvements, little or nothing of a practical nature has been accomplished. Why so little has been accomplished, and why the Indian Government should be held to a strict accountability, will be obvious to all who make themselves familiar with the story as now told by Macnamara, and as it has been told again and again by Peters and others.

So long as the great religious festivals of the Hindoo are tolerated; so long as the death-rate of these unfortunates is annually as great as it is at present (for we read that at Puri, the site of the far-famed temple of Juggernaut, there are annually 12,000 cholera deaths, and as yet the government has attempted at this point no sanitary surveillance, as they have at Hurdwar, Allahabad and other points); so long as these unfortunate people are permitted to collect by the hundreds of thousands in lodging houses, the very description of which is sickening; so long as the priests are allowed to batten upon the sale of "holy food;" so long as these worshipers, worn out by the fatigues of travel, by debaucheries, and by bodily infirmities, are permitted to pursue their weary way along all thoroughfares, *so long* will cholera (A) be conveyed from the holy cities to all portions of India and to all nations of the world.

At the present day it is surely madness to dispute the array of truths as presented in this the latest history of the disease, and to assert upon the strength of instances of insignificant value that the facts narrated can tend but to this broad truth. Strange as it is, there certainly are numbers of such misguided individuals, and conspicuously among them we find the name of the statistical officer of the Sanitary Commissioner with the government for India. The reports of this gentleman are based upon communications made to him by medical officers located throughout Bengal. It is a notorious fact, that of late

years in Bengal little or no effort has been made to keep any record of the migrations of cholera, for it has long been assumed that the disease is only blown about by the winds, and therefore any inquiry into the track of an epidemic is useless.

This state of medical opinion undoubtedly results in great measure from the dogmatic assertions of this statistical officer, who found himself obliged to differ with his predecessors to insure his own notoriety, must perforce manufacture a theory, and having observed locusts borne by the wind 500 miles out at sea, concludes that cholera (A.) is an aerial something which can also be blown by the wind like the locust, a few dropping here and there, while huge swarms settle down in other places. It is most pitiable to notice in his reports such childish illustrations as the following: "I have often said that no palpable manifestation realized to my mind the idea of the diffusion of the impalpable agent, cholera, except a locust flight. At one time leaving not a trace behind, at another dropping individuals only from the locust cloud, at a third sending down powerful off-shoots; the locust flight darkening the sky overhead, traverse the widest tracks until it alights, because it has struck against an aerial wall of obstruction."*

"The flight of locusts appear to have deposited their eggs, and the larvæ are described as covering the country.

"The locusts are out over almost all the entire country. They are now doing little harm, but great apprehensions are entertained for the result when the young crops are produced."†

It is evident from such remarks that Bryden infers that there are cholera eggs or germs as well as those of locusts. As cholera often travels against the strongest winds and has often been manifestly carried about by cholera patients, soiled cloths, etc., the germs of cholera must attach themselves to persons and clothes. Bryden's theory, when stripped of its false assumptions about aerial conveyance, unwittingly gives proof and force to the more correct theory of human conveyance.

It is very true that the task of tracing cases of cholera (A.)

* This aerial wall must be an opposing wind, but against opposing winds cholera often travels.

† Report on the general aspects of epidemic cholera in 1869, part 2, page 38.

through Bengal in these later days is a task of gigantic proportions. The native population is immense, estimated at 100,000,000. The movements of pilgrims are so vast that no one knows how cholera (A.) enters the various cities, towns and villages, for the natives exercise all their cunning to avoid falling into the hands of the English medical men. Add to these obstacles the apathy induced by a temperature of 90° to 105° in the European, and then, to all else, the reprehensible conduct of the statistical officer in obstinately contending for his theory, and it is easy to understand how all spirit of independent investigation is well nigh crushed out among the Bengal medical men, *and they can find nothing human in the diffusion of the disease.* It is unfair to say that this gentleman has been misled by the reports of his subordinates, for it may justly be charged *that he has misled the local medical men, not they him.*

The exposé made by Macnamara will undoubtedly bear good fruit, and if naught else is accomplished by his work, for this alone the world will remain his debtor.

Dr. James Christie, late physician to the Sultan of Zanzibar, has been known to the Profession as a cholera observer for some years. In 1870 and 1871 he published in the "Lancet"* papers upon cholera in East Africa, and having achieved a most signal success in collecting data, has given to the world a valuable work. It is certainly to his credit that in the wilds of Africa, surrounded by all the privations of life in Zanzibar, he has been able to track out the course of this disease better than it has been done in many more favored lands.

One of the most fortuitous results of this work is the public refutation which is made of the much-quoted statement of the Bengal statistical officer, *that the cholera which occurred upon the East coast of Africa, in Zanzibar in* 1869, *was blown over in a few days from India.*† It will be remembered that this statement was made in spite of the assertion of Dr. Kirk, of Zanzibar,‡ "that the epidemic had come from the *West* to the coast of Zanzibar," and it has long been known to students that

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* Lancet for 1870 and 1871.

† General aspects of epidemic cholera in 1869. ‡ Ibid, page 38.

this same Bengal officer suppressed the positive fact given by Kirk, *that the disease arrived by caravan from the Northwest.*

Christie demonstrates beyond a peradventure, that the Mecca cholera in 1865 had crossed the Red Sea at Suakem and Massuah in Nubia, traveled along the northern caravan route down through Abyssinia and Ethiopia, and that the disease was epidemic upon this route from 1866 till 1869, when it reached Zanzibar from the *West* and not from *India on the East.* In making this statement, Christie modestly states "that this fact seems to have escaped Dr. Bryden's attention," but at the same time he asserts that the fact was distinctly stated in an official report sent to Bengal.* Kirk also repudiates utterly the statements of Dr. Bryden,† and proves that the cholera reached Zanzibar only by propagation along the line of human travel, and that it was several years in reaching Zanzibar from Mecca.‡

It would be quite unfair to make these statements without presenting in detail the proof.

The first report of Dr. Kirk, dated November 25, 1869, states, "it is now more than a month since the first rumors reached us of the approach of cholera from *the West.*"§

Dr. Bryden suppressed part of Kirk's second official report, which was dated February 6, 1870, in which he states a fact which Christie‖ writes was well known to every one in Zanzibar: "Cholera came to us by the Masai, or northern caravan route." Christie says this seems to have escaped Dr. Bryden's notice, for the statement is distinctly made that the epidemic came to the coast from the West along what is known in Zanzibar as the northern caravan route, and he "feels assured that Dr. Kirk would repudiate the conclusions arrived at by Dr. Bryden, and maintain, on the contrary, that the epidemic in East Africa was not air-borne by the northeast monsoon of 1869, but was propagated along the line of human intercourse, as he distinctly states, from the Masai country."¶

Dr. Bryden makes no notice of Dr. Christie's reports in 1871 and 1872 to the Epidemiological Society of London.

* Kirk's Official Reports, Nov. 25, 1869, and Feb. 6, 1870.

† General Aspect of Epidemic Cholera in 1869, p. 38.

‡ Christie, op. cit., pp. 97–118. § Christie, op. cit., pp. 465–474.

‖ Ibid, p. 460. ¶ Ibid, p. 466.

From such an exposé, it is evident that if Dr Bryden is capable of so many suppressions and deviations of the truth about one epidemic, how many may he not be guilty of in the scores of epidemics he has described?

The simple truth of all this is, that the Bengal officer suppressed so much of the reports of these gentlemen as interfered with his theory, trusting, no doubt, that Zanzibar was so far away that no one would detect him; but fortunately the eyes of careful observers were on his work. Peters, of New York, first called attention to his error. Netten Radcliffe followed it up, and now Macnamara, Christie, and Kirk have sent him completely to the wall.

The reports of this Bengal statistical officer are filled with such inaccuracies and childish conclusions, that they are unworthy to be longer received as authority. It would be well could we stop here; but the results of this theory have had so much effect upon others; have caused so many "one-sided" opinions to be recorded, and have in reality produced such disastrous consequences in Bengal, that we are compelled to call attention to a recent and striking illustration. Two medical officers of the British service, on special duty with the Sanitary Commissioner with the Government for India, have, for the past few years, been frequently before the medical world through the medium of their microscopic examinations. The work which they have produced is certainly wonderfully good, and would stand forever to their credit, had they evidently not strained their conclusions to suit the theories now fashionable in Bengal. The most recent demonstration upon which we base this assertion is to be found in the "Lancet" of this year.*

Surgeon-Major J. Fairweather, Civil Surgeon at Delhi, reported that during the epidemic of 1875 a fatal disease strongly resembling cholera broke out among the cats of the city. He details at length a series of experiments made by him to determine the possibility of inducing this disease in cats by the excreta of human cholera patients, as well as the communicability of this disease from one cat to another. These experiments are conscientiously reported. The cases of failure are even more

* Lancet, July 22 and 29, 1876.

prominently noted than those of success, while the notes of post-mortem appearances are conspicuous. At the request of the Sanitary Commissioner, the entire viscera of two cats (one of which died of the natural disease and the other of the induced disease) were preserved in spirits and sent to Calcutta to be examined by Drs. D. Cunningham and Lewis, and the notes of these gentlemen appended to the original paper are a wonder of one-sided investigation. Their report concludes as follows: "*The specimen sent from Delhi showed no anatomical or microscopic appearance indicating that the animals from which they were obtained had been affected by cholera or any similar disease.*"

The grounds upon which this opinion was based appear to have been: 1. That the intestinal contents gave an acid reäction with litmus paper;* 2. That a round worm was found in the intestines, which worm frequently gives rise to intestinal disturbance and severe vomiting in their hosts; 3. That in an experiment made by them with two cats kept without food for twelve hours and then killed, the intestinal contents, according to their idea, were "scarcely to be distinguished from the specimen sent down from Delhi."

The civil surgeon at Delhi was certainly most remiss not to have been cognizant of the fact that *an epidemic of "round worms"* had attacked the cats of that city; and further, that the human epidemic had diminished the supply of feline food; for certainly these two causes are sufficiently powerful to account for the large number of dead cats found daily by the police inspectors, or else the opinion which we have quoted bears the impress of local influence.

The work of Christie contains much that is new and interesting. For the first time the great caravan routes leading from the city of Zanzibar are described. Upon them the way is now clear to study the travels of cholera (A.). These routes go out into the interior in various directions—south, west, northwest, and north. Upon them the caravans from the north meet

* As regards the acidity of the intestinal contents, it must be borne in mind that the specimens had been immersed in alcohol for some time before examination.

the caravans of the south; commodities are exchanged, among the list of which is cholera (A.). Here we find history reproducing itself; this time upon virgin soil. It has been conclusively shown that this disease is diffused over India by the annual "pilgrims' progress," having as an initial point of departure the great gatherings of the inhabitants. So we read in Christie "that at Berbera, on the African coast of the Gulf of Aden, just below the Red Sea, there is annually held a fair, which lasts from October until April, the town being entirely deserted during the interval. It may be described as the meeting-place in Africa of the numerous tribes and the traders of the Red Sea, the Persian Gulf, the Gulfs of Oman, Aden, and various parts of India. Formerly as many as 20,000 strangers were usually collected there at one time, and although the fair has decreased much of late years, still there is annually a very large gathering. The inland tribes of Africa leave Berbera in the month of March on their return journey."*

New light is also thrown upon the great cholera outbreak at Mecca in 1865, when over 20,000 pilgrims died of the disease in six days. It is shown that cholera (A.) was epidemic at the homes of many of the pilgrims who had arrived from India, and that the Mecca outbreak did not occur until after the arrival at that city of these people.

As we must henceforth look upon Mecca as a focus from which cholera (A.) has been distributed to the continent of Africa, it is well at this time to pass briefly in review some of the most important facts attending this great annual gathering.

For many centuries there has been a perennial stream of pilgrims to and from the holy city of Mecca. To be present at the Kourban Bairam, which, by reason of the Mohammedan year being shorter than the Christian by rather more than eleven days, is gradually shifted from season to season throughout the year, is the great aim of Mohammedan life. To accomplish this, homes are abandoned and the most exhausting journeys are undertaken. From the North Atlantic and Mediterranean shores of Africa; from Timbuctoo and Western Africa; from the borders of Siberia, the Danube, the Euxine, and the

* Christie, pp. 126 to 147.

Sea of Azof; from the western frontiers of China; from India, South Africa, and the most remote Mohammedan extensions in the East, a constant stream of human beings moves to and from Mecca. For the pilgrimage, at least once in a lifetime, is binding on all true Mohammedans, and he who dies without having made it, may as well die a Jew as a Christian.*

The return of one body of pilgrims is never accomplished before another body is upon the move. They arrive at Mecca in great caravans from Egypt, Damascus, and Persia, or at Jedda (the port of Mecca) upon native vessels. The misery of these pilgrims and the hardships which they endure have been fully set forth by the few Europeans† who have succeeded in penetrating among the faithful at the celebration of their religious ceremonies.

The native vessels which carry pilgrims to Jedda rival those of any slave dhow ever captured. Each passenger receives but sufficient space upon which to squat. To stretch himself, he must encroach upon the territory of his neighbor. The intense heat of the day, the chill of the night, the privation from food and exercise, the loss of sleep induces a physical condition before their arrival but little short of death; many die of exhaustion before reaching port, and the great mass of those who land can with but difficulty drag themselves to the holy city.

In the caravans persons of importance travel with considerable comfort, but the poorer classes are absolutely foot passengers, making their way by assisting at the loading and unloading of the camels, and subsisting upon the charity of the rich. Begrimed with filth (for the Moslem law allows sand ablutions where water is scarce), unprovided with changes of raiment, overpowered with penury and fatigue, the aged and the

* Al Koran. Translation by Sale, p. 152.

† A Faithful Account of the Religion and Manners of the Mohammedans, etc., etc. By Joseph Pitts. London, 1708.

† Translations of the Koran. Preliminary Discourse. G. Gale. London, 1801.

† Travels in Arabia. By J. S Burkhardt. Two vols. London, 1829.

† Narrative of a Journey into Khorasan. J. B. Fraser. London, 1825.

† Personal Narrative of a Pilgrimage to El Medina and Mecca. By Captain R. F. Burton. London, 1856.

young engage in a scramble for existence, each actuated by the hope of reaching their highest earthly ambition of kissing the *Black Stone* in the Kaaba, or else fainting upon the road, "they may depart to instant beatitude, for all who die during a pilgrimage are martyrs."

As caravans approach El Medina they are greatly increased in number by the addition of smaller bodies of pilgrims, taking advantage of the convergence of routes to this city made holy by having been the home and by containing the tomb of the Prophet. By the 25th of July of each year the city is thronged by vast crowds who stop to visit the sacred tomb. From Medina there are few roads to Mecca; along them the pilgrims hurry; forced marches are made, and increased privations are endured. At certain fixed points upon all approaches to Mecca the ihram or sacred habit is put on, without regard to age or infirmities; the ordinary clothing is cast aside, and is replaced by two cloths; one of which is used to conceal the genitalia, while the other is thrown over the shoulders, and no other clothing. Either by day or by night it may be worn until the pilgrimage is accomplished.

With head and feet uncovered; forbidden to kill louse or flea upon their persons, or to hold intercourse with women, they enter upon the last stage of the journey. Of the ihram, Burkhardt writes: "Whether assumed in summer or in winter the ihram is equally inconvenient and prejudicial to health, particularly among the Northern Mohammedans who, accustomed to thick woolen clothes, are at this period obliged to leave them off for many days."

Having arrived at Mecca, the pilgrims, without rest or refreshment, enter upon their religious duties. These duties have been so frequently described that any repetition is unnecessary, save upon two points having a direct bearing upon the diffusion of cholera (A.). The first duty is the visit to the Kaaba, the holy temple, the tomb of Ishmael, in which rests the stone let down from Heaven. Upon arriving at the Kaaba, it is urged as an especial duty that all pilgrims shall drink and perform their ablutions at the holy well *Zem Zem*. This is the spring which gushed out for the relief of Ishmael when, with his mother

he was driven from the tents of his father Abraham. The well is in a room upon the southeastern portion of the Kaaba. Its mouth is surrounded by a wall five feet in height and about ten feet in diameter. Upon the wall attendants stand; the water is drawn in leathern buckets; each individual drinks all that he can, and upon each several skinsfull of the water are dashed. With this holy water each devotee is permitted to wash all portions of his body above the waist, but it must flow unobstructed over the lower extremities.

The room is constantly flooded with the water thus used *en douche*, and it flows back into the well in a steady stream, carrying with it the impurities obtained from the persons of the pilgrims. This water, when first drawn, is milkish in color. It is tepid, saltish, and bitter, though to a less degree than the other wells of the town. Its inordinate use, and the pilgrims always drink it to excess, invariably induces diarrhœa in, and a crop of boils upon, the persons of those who drink it. It is so holy that none may be lost; with it the floors of the Kaaba and its surrounding porches are daily washed, and the water thus used is eagerly drunk by the lower classes of the pilgrims. Nearly every family in the town obtains daily a jar of this water, which they use only for drinking and ablutions. Few pilgrims quit Mecca without carrying some away in bottles of copper or tin. Clothes are dipped in it, folded, and laid carefully away, to be used at far distant homes as winding-sheets. It is impossible to overestimate the influence of *Zem Zem* water in the diffusion of cholera, both at and from Mecca.

The succeeding duties of the pilgrims are arduous in the extreme. Even the strong and hardy Burton, who visited Mecca as a Moslem, was unable to complete them through sheer fatigue.

The sanitary condition of Mecca, at the time of the festivals, is thus described by Burkhardt: * "Rubbish and filth covered all the streets, and nobody appeared disposed to remove it. The skirts of the town were covered with the carcasses of dead camels, the smell from which rendered the air, even in the midst of the town, most offensive, and certainly contributed to the

* Travels in Arabia. Vol. II., p. 85.

many diseases now prevalent. Several hundred of these carcasses lay near the reservoirs of Hadj, and the Arabs inhabiting that part of Mecca never walked out without stuffing into their nostrils small pieces of cotton, which they carried suspended by a thread around the neck. But this is not all; at this time the Meccans are in the habit of emptying the privies of their houses, and being too lazy to carry the contents beyond the precincts of the town, they merely dig a hole in the street before the door of the dwelling and therein deposit them, covering the spot only with a layer of earth. The consequences of this habit may be easily imagined."

Again he writes: "The termination of the Hadj gives a very different appearance to the temple. Disease and mortality which succeed the fatigues endured on the journey are caused by the light covering of the ihram, the unhealthy lodgings at Mecca, the bad fare, and sometimes absolute want, fill the mosque with dead bodies carried thither to receive the Imam's prayer; or with sick persons, many of whom, when their dissolution approaches, are brought to the colonnades, that they may either be cured by the sight of the Kaaba, or at least have the satisfaction of expiring within the sacred enclosure. Poor Hadjys, worn out with disease and hunger, are seen dragging their emaciated bodies along the columns. When they feel their last moments approaching, they cover themselves with their tattered garment, and often a whole day passes before it is discovered that they are dead. There are several persons in the service of the mosque employed to wash carefully the spot on which those who expire in the mosque have lain, and to bury all the poor and friendless strangers who die at Mecca."

As the Moslem endeavors to secure the rapid decomposition of the dead, the most primitive methods of interment are adopted. Their burial grounds are described as *dangerous places*, and Captain Burton was frequently obliged to resist with armed force parties who would bury their dead within the very shadow of his tent. Absolutely no sanitary precautions are adopted at Mecca to prevent the origin or spread of disease. The formulæ of Inshallah and Kismat are used in the place of methods of prevention, and epidemics are looked upon as pun-

ishment of God upon the sins of the world. In face of all the causes of disease which riot in this ancient city, it is an absolute fact *that cholera (A.) has never occurred there until after the arrival of the Indian pilgrims; until after they have joined the vast crowd, and until after the disease has occurred amongst them.**

An explosion of cholera (A.) having once occurred at Mecca, the terror and confusion becomes almost indescribable, but the sense of religious duties is so strong that the ceremonies are never abridged. They progress at their usual rate, and the dead and the dying are packed in with those as yet uninfected. The duties once completed, the vast crowds struggle to escape from the holy city even more eagerly than they did to enter it. With death staring them in the face, they set out upon the return journey. Their track is marked by the dying and the dead. None can stop to care for the sick or to bury the dead. It is a race for life.

Among the caravans, the virulence of the disease generally subsides in traversing the arid waste of Arabia, but the poison fixed upon articles of clothing, camp furniture, and merchandise, is the means by which outbreaks of the disease are occasioned in cities upon the routes to far distant homes.

Among the pilgrims returning in the native dhows, exposed to alternations of heat and moisture, filth and overcrowding, the disease remains in violent presence until land is made. Not infrequently dhows have been found at sea, drifting, with cargoes of dead and dying.

At Mecca it is thus shown the essential factors of a cholera outbreak are frequently gathered together. An immense mass of human beings, soiled and prostrated by long journeys, suffering from the want of food, the want of rest, the most intense mental excitement, the head and feet exposed, without covering, and the body with but a single cloth, to the fierce rays of the Arabian sun; scorched by day and chilled to the bones by night; the specific poison of cholera lurking in the garments of some of the pilgrims; *Zem Zem* water to furnish the

* See Radcliffe on Origin of the Diffusion of 1875. Op. cit., p. 14.

medium in which this poison may multiply itself; the intense solar heat to hasten the development of virulence in this specific poison which until this combination of moisture and heat was inert and harmless; it may be asked, if these garments were infected with cholera matter, why was it that the disease did not develop during the long journey from which these people had just arrived, especially as frequent ablutions is an article of faith with them? The answer is found in the fact, that upon long desert journeys water is a commodity more precious than gold, and that simply the form of ablution by rubbing the hands and face with sand is the rule under such circumstances. It is more than probable that of the 100,000 individuals who upon that day, in 1865, were gathered around the holy well Zem Zem, the bodies of nine-tenths had not known water since leaving their homes.

In connection with this Arabian story the influence of pilgrims and tramps of all nations and to other shrines in conveying infectious diseases from country to country presents itself in strong light, and to it the attention of sanitarians has of late years been directed. The pilgrimages to and from India and Arabia have been studied, their influence in the dissemination of disease has been positively determined, and it behooves us to apply the same measure of investigation to other countries. Russia, especially her southeastern provinces, is at present the most interesting of all the new fields of study. It will be remembered that in 1872 Pelikan announced that cholera (A.) had become endemic in this portion of the empire; but Netten Radcliffe was able to show that the disease which had existed for so long a time was not the result of acclimatization but rather that of constant importation.

Dr. John C. Peters, whose investigations have done so much towards establishing the truth as to this disease, and whose memory will be cherished long after the names of those who have attempted to defame him have been forgotten, has lately called attention to the pilgrims of Russia. He quotes Dr. W. H. Dixon,* who writes:

"Next to his religious energy, the mastering passion of the

* Free Russia, page 34.

Russian is the irresistible craving of his heart for a wandering life. All slavonic tribes are more or less fond of roving to and fro, of peddling, tramping and seeing the world.

"A pilgrim perfect in his calling will go from shrine to shrine for several years. They go in bands of 50 or 60 and some reach the valley of Nazareth, the heights of Bethlehem and Zion and return to the shrines at Kieff. You meet them on every track, you find them in the yard of every house. They creep in at back doors and carry about with them relics and rags which they vend at high rates. A bit of rock from Nazareth, a drop of water from the Jordan, a thread from the Saviour's seamless coat, a chip of the genuine cross.

"Thousands of such vagrants roam about the country, and the peasant who thinks the crossing of his doorstep by a pilgrim brings him blessing, not only lodges him for the night, but helps him on the road by day. Every year they go to Kieff and other Russian shrines, and to Jerusalem. Annually some hundreds achieve the highest effort of kissing the stones in front of the Redeemer's tomb."

In any country infested by disease and by tramps, who can truthfully declare that an individual in whom the disease has developed has not come in contact with infected persons? The negroes upon a Mississippi plantation may have been kept at their work by day, and, so far as their master was able, to their cabins at night; but who can positively assert that these cabins were not, during the darkness of the night, the refuge of some tramp, who departing before day left the disease behind him. The mere assertion of individual opinion is of no value if it can be shown beyond the possibility of a doubt that no communication with the infected objects, animate or inanimate, existed. The case is different. The evidence, however, must be submitted to critical investigation before it can be accepted as final.

Macnamara,* having access to the reports of the Government Emigration Agent at Calcutta, is able to throw some light upon the subject of the introduction of cholera (A.) into the West Indies in 1872, and the data furnished of cholera upon the *Sea Queen*, the *Humbar*, the *Poonah*, the *Kate Killock*, and the *Forfarshire*, in 1872; the *Emnor*, the *Golden Fleece*, the *Sir H. Lawrence*, the *Hereford*, and the *Lochlomond*, in 1873, has probably

* A history of cholera, p. 361.

furnished the clew by means of which the introduction of the disease into the United States in 1873 may be robbed of its mystery.*

It may be well to briefly recall the evidence found and offered so far as relates to the introduction of the disease in the United States in that year. In attempting to investigate the initial steps of this outbreak, we were at once confronted by the assertion, that the disease had originated in or near the city of New Orleans, that it was of domestic origin, and that it could not be traced to any foreign importation. The task of eliciting any further testimony than that presented by the State Board of Health was well nigh hopeless, but by dint of patient investigation the following truths were established.

1. That the majority of the first 25 *fatal cholera cases* narrated in the report of the Board of Health originated upon the steamboat and ship levees of the city of New Orleans.

2. That a total of 6,079 foreign emigrants arrived at the port of New Orleans in 1873, 5,869 of whom were from Europe.

3. That the emigrant boarding-houses face the river upon the steamboat levee, and that during the months of January, February and March, 1873, the majority of these houses were filled with emigrants.

4. That the quarantine maintained at the Mississippi river station during the months of December, 1872, and January and February, 1873, was utterly worthless, and that the reports of the quarantine officer could not be relied upon.

During that investigation it was several times intimated to us that cholera (A.) had existed in the West Indies during the late months of 1872, but the only tangible fact we could find was the report of the United States Consul at Kingston, Jamaica, that a coolie ship had arrived at Bluff's Bay in that island, having lost some 60 coolies from the disease, and that one case had occurred upon the island since the arrival of that vessel. The official report of the Commissioner of Emigration of the State of Louisiana shows that in 1873, 210 emigrants were received by him from West Indian and South American ports, but no record of the number of passengers or the num-

* Cholera epidemic of 1873 in the United States, page 104.

ber of the crews of the vessels could be obtained. The evidence furnished by Macnamara will undoubtedly bear fruit in due season.

It is at present a notorious fact, that during the past year cholera (A.) having escaped from India spread to the eastern shores of the Mediterranean. It is also true that during the past year there have been violent explosions of the disease in India, and that the disease more frequently breaks out in the hill country than it has ever before done. It is a fact that a considerable body of Mohammedan troops in Syria became infected with the disease, which they communicated to the surrounding country. *Again, cholera history is in the process of repeating itself.* Nations are arming for the final contest between the cross and the crescent. The followers of Mohammed are ranging themselves upon the line of the Danube. The Porte will from necessity call in all her outlying bodies of troops, and it may be looked upon as a matter of almost absolute certainty that before the eastern question is settled cholera will have invaded Europe; and in one or two years North America will in all probability be called upon to record a new epidemic of the disease.

The time therefore has come when it is necessary that medical men should consider with care all facts which have been elicited from previous epidemics. The subject is so vast, the interests at stake are so vital, that all minor considerations should be set aside, and while the differences of opinion of all fair reasoning minds should be respected, no one should hesitate to form and record his opinion.

By a considerable number of American medical men cholera (A.) is looked upon as *an endemic disease* of *malarial origin.* For the consideration of such gentlemen we would recall attention to a statement made in the history of the cholera epidemic of 1873, page 659. During the late civil war, the United States had in the field an army of 2,335,942, or during the years of the war a mean strength of about 783,905 men. These troops were in camps constantly exposed to all the vicissitudes of campaigns, or were in hospitals where, in spite of the lavish precautions which were adopted frequently, all the disadvantages of over-

crowding and deficient food were present. Vast numbers of men were transported to and from the scene of active operations upon steam transports. Prison pens were formed, in which overcrowding, bad ventilation, indifferent police and unsuitable food were present to coöperate with local malarial influences upon the unfortunate prisoners, and these events occurred within the limits of the worst malarial districts of the United States.

The record of the medical history of the war demonstrates that there occurred, in the army, of malarial diseases, *one million four hundred and sixty eight thousand four hundred and ten cases, with forty-six thousand three hundred and ten deaths, and of intestinal diseases, one million seven hundred and sixty-five thousand five hundred and one cases, with forty-four thousand eight hundred and sixty-three deaths.** Add to these figures the statistics of the United States Navy and those of the Confederate Army and Navy, and the mass of circumstantial evidence is overwhelming. The figures at our command give a total of *ninety-one thousand one hundred and seventy-three deaths* from malarial and intestinal diseases occurring in a highly malarial district, and yet not one case of cholera (A.) occurred upon the continent. As if to emphasize this fact, of the *two million three hundred and thirty-five thousand nine hundred and forty-two men* composing the army of the United States, but *three hundred and five deaths* occurred from cholera-morbus. Reverse this picture. The war was at an end, the armies of the North and of the South had been disbanded but a few short weeks, when cholera (A.) *having been imported into the United States*, the movements of recruits for the small standing army of the nation diffused the disease and induced the American epidemic of 1866 and 1867.

By the movement of troops in India this disease has, time and again (since the memorable epidemic in the army of the Marquis of Hastings) been carried from one station to another. In 1832 the troops en route for the Black Hawk war scattered the disease over the Northwest and down the Valley of the Mississippi to the city of New Orleans. The Crimean war ex-

* Cholera Epidemic of 1873 in the United States, p. 659.

hibits another notable instance of the diffusion of cholera (A.) by the movements of armies. The movements of a few recruits in 1866 scattered the disease over the States, and in 1867, by the movements of but two infantry regiments, the disease was diffused over the high dry plains of Kansas. We, ourselves, in the latter year, were upon duty with a moving column of troops infected with the disease, among whom it did not "die out" until the head-waters of the Arkansas river were reached, in the heart of the Sierra Nevada.

This evidence is so plain and so convincing that it is almost a work of supererogation to add additional testimony. Upon it we would present for consideration the following propositions:

PROPOSITION I.—*Cholera (A.) has never yet originated upon the North American Continent, but that it has invariably reached its shores after it has been transported across the Atlantic ocean.*

The stability of this proposition having been established, the work of arresting the disease after it has been imported and of protecting the interests of the communities committed to our care, is a matter of small difficulty. (We write of communities in the interior of the continent.) But there are many who will not recognize the value of this illustration, and to such we would throw out for consideration the following queries: Has an epidemic of cholera (A.) ever occurred on the American Continent at a time when the disease was confined to India? Has an epidemic of cholera (A.) ever occurred in the interior of the American Continent prior to the announcement of its arrival in Western Europe, or at the seaports of North America?

During the past few years we have heard much of two instances of mysterious development of cholera (A.) during the year 1835 in the States of Kentucky and Mississippi, but the gentlemen who use these illustrations either forget or are ignorant of the fact that throughout the years 1832, 1833, 1834, and 1835, cholera (A.) was not only epidemic in the United States, notably in the Valley of the Mississippi, but that each year a fresh importation of the disease occurred. In 1832 cholera (A.) was imported into the harbors of Quebec and New York from

Great Britain. In 1833 it was imported into New Orleans from the West Indies. In 1834 Quebec again received the disease from Europe, and in 1835 New Orleans, La., and Charleston, S. C., received it directly from the Island of Cuba.

We assert confidently and without fear of satisfactory contradiction that all the facts which can be gathered prove the truth of this proposition, and we maintain that upon its truth the safety and well-being of all communities lying within the borders of North America depend, and these communities should be possessed of sufficient information to enable them to discriminate between counsellors whose opinions are valuable and those whose opinions are worthless. The time has come when the health office of great cities should not be entrusted to inexperienced men from party considerations alone; such individuals are in the majority of instances unable to properly discharge their duties, and they may often be classed among those (to borrow an illustration) who are ignorant even of their own unfitness, or of the very existence of knowledge which they do not themselves possess.

The diffusion of a proper knowledge of cholera (A.) among the laity of American communities is influenced to a marked degree by those medical men who are unable to distinguish between cholera Asiatica, cholera sporadica, cholera morbus, and some forms of pernicious intermittent and remittent fevers. These gentlemen will tell one "*that they know cholera, for they have treated it all their lives,*" and they are seemingly oblivious to the fact that America has known but five epidemics of the disease; that there was a lapse of *thirteen, four, ten,* and *six* years respectively between each epidemic, when the United States was absolutely free from the disease.

We are reminded of a notable instance of this ignorance which occurred in a large city during the heated term of 1874. The leading newspaper of that city one morning contained the startling intelligence that a fatal case of Asiatic cholera had occurred the day before, giving detailed particulars. Being anxious of adding to our stock of cholera knowledge, we telegraphed the gentleman reported as having had charge of the case, asking its identity, and received the answer now before us.

Pages 33-40 missing

body has been subjected are due each of the post-mortem changes which have been reported. Space, however, forbids the extension of the subject to such length.

The analogy between the symptoms presented in cases of death from hæmorrhage and those of death from cholera (A.) are most striking; but it must be borne in mind that the collapse of cholera differs from that of hæmorrhage in this, that in cholera it is but the fluid contents of the blood vessels that are drawn off, the solid constituents remain, the corpuscles are rendered unfit to carry oxygen, and the diseased mucous surfaces are unable to absorb fluids which may come in contact with them. In hæmorrhage the entire constituents of the blood flow away, but the power of absorption is present and is rapidly accomplished.

The rationale of a case of cholera (A.), when viewed from the standpoint of this *practical theory*, is as follows: The specific poison of cholera gaining access to the stomach of an individual whose digestive powers are impaired (either by disease, fatigue, mental emotions, privation from food, excessive debauch of every description, or from anything which may tend to render the intestinal juices alkaline), a rapid proliferation of the morbid matter takes place. This morbid matter fastens upon the intestinal epithelium, destroys and strips it off. The irritation caused by this induces the primary symptoms of the disease. The villi of the small intestines having lost their epithelial covering, an exudation of the watery constituents of the blood occurs. As the dehydration is accomplished, the tissues are called upon, and to the rapid abstraction of the major portion of the water in the economy the subsequent symptoms of the attack depend.

Instances are recorded of the recovery of dropsical patients from attacks of cholera (A.) where so complete had been the abstraction of the fluid that the skin hung in loose folds upon the body.*

If cholera (A.) is a disease of the intestinal mucous surface; if the symptoms of the disease are induced alone by the rapid dehydration of the economy; if it depends alone upon the rapid

* Medical Times and Gazette, August, 1866, p. 138.

pouring out of the fluid portion of the blood, *why is it that the disease is not invariably fatal?* Why is it that, if left to Nature, about one-half of those attacked with the disease recover of themselves, although suppression of the urine may have existed, and fever and other complications may have occurred?

To our mind, the most plausible answer which can be advanced, is that of Dr. Pacini, of Florence, "that in some cases the vessels of the mucous membrane beneath the detached epithelium become clogged with the viscid blood, which acts, in fact, as an impediment to the circulation through them, serving a curative purpose, just as a coägulum would do in the case of a wounded artery; for, by arresting the circulation, new epithelium is allowed to form over the abraded portions of the intestine, preventing the outpouring of the serum from the denuded vessels."*

This is an eminently practical theory of Pacini, and one which has all the well-known symptoms strongly in its favor; for we well know that the vessels of the mucous membrane become not only plugged, but at times they are intensely congested, and occasionally as reäction comes on they give way with a resultant hæmorrhage.†

The chemical analyses of the rice-water discharges of Thudichum are strong evidence in support of his theory. He writes:

"Rice-water contains the following ingredients: Vibriones, cells from the surface of the intestines, granular débris of cells, mucine, modified hæmochrome, albumen, albuminous body giving rose-pink reäction, butyric acid, acetic acid, ammonia, leucine, inorganic salts. It is in an active state of decomposition and evolves gas, which at first is composed almost entirely of nitrogen. Soon, however, carbonic acid prevails, and ultimately nothing but carbonic acid is evolved. At one period some hydrogen is developed. We can not discover any specificity in the above ingredients, but many of them are analogous to the products of ordinary processes of putrefaction. If it is admitted that cholera evacuations acquire infective powers only after the period of fermentation, it is also easy to understand that the specific infecting power may belong to albumen or mucine at a particular stage of disintegration or chemical cleavage."

The examinations of Thudichum, conducted with all the

* Macnamara, op. cit., p. 345. † Idem., p. 449.

appliances of a liberal government, indicates the existence of a considerable amount of molecular matter in these dejections; and it is this molecular matter which is claimed to be the specific infecting cause, when it has advanced to a certain stage of decomposition. This matter has been most carefully studied by Macnamara,* and from this study he is led to insist that it is this molecular matter having advanced to that stage, characterized by the presence of vibriones (not the vibriones themselves), which is capable of inducing the disease. It is asserted by him "that the fresh dejecta in the active stages of the disease contain no vibriones, but toward the end of collapse, when the evacuations are passed less frequently, probably remaining in the intestines for some hours, vibriones may be seen in the fluid immediately after it has been passed."

By the majority of observers, it is insisted that the destruction of the intestinal epithelium occurs during the life of the patient. Indeed, this is an essential to the perfection of this practical theory in the etiology of the disease. All the events in the clinical history of a case of cholera seem to bear out this theory; but Parkes, Aitken, Bruberger, Lewis, Cunningham, and others, object to this theory of ante-mortem epithelial destruction, on the ground that they have been unable to discover any evidence of epithelial cells in fresh cholera stools. The solution of this difficulty, it seems to us, to be most easy. Each of the gentlemen enumerated have based their opinions upon the investigation of rice-water dejecta; that is, they have looked for the fragments of a dam in the mighty rush of the waters that followed its destruction. The rice-water dejecta are the result not of an effort on the part of Nature to eliminate from the blood any morbific material which it may contain, nor do they result from any disturbance of the nervous system, but they occur simply because the specific poison of cholera has stripped off the epithelial layer which formed the protective covering of the blood vessels, and there is naught to prevent a rapid exudation of the fluid portions of the blood. As the disease advances, the entire mucous surface of the alimentary canal, from the mouth to the anus, is stripped of its epithelium,

* Op. cit., p. 334.

and the process of dehydration is more rapidly performed. The dejecta in which to look for these fragments of the epithelium are therefore those of the premonitory stages, or in the first that are rice-water in character, not in those which are voided after the intestinal canal has been washed by the torrent which has poured through it.

Oh, men! who hold in your hands the most sacred domestic ties, abandon the hypotheses which have caused sorrow and mourning so often throughout the land. Abandon the teachers who have led you astray, and whose counsels have caused such destruction of human life. Study this practical theory. It is but a legitimate deduction from many facts not contradicted by equally numerous and equally well-attested facts. This theory has been the means of saving thousands of valuable lives; it has lessened the cries of widows and orphans; it is the means appointed by which dire calamity may be averted.

The injury inflicted upon the world by the apathy and egotism of the Indian sanitary authorities can never be counteracted. These authorities stand arraigned before the world for having permitted the continual escape of this dread disease from its home. Already Persia has so often been invaded that the domestication of cholera (A.) in that country may be taken as an assumed fact. Asia and Europe are, and perhaps always will be, exposed to its inroads; but America, surrounded by water, a hemisphere to itself, with natural advantages which no other nation enjoys, may, by the exercise of scientific prudence, keep the disease from its shores; nay, may defy it.

The remedy is simple. 1. *Prevent the importation of the disease.* In a series of papers which we published during 1874 in the "American Practitioner," and later in the "History of the Cholera Epidemic of 1873 in the United States," we advanced and advocated the establishment of a national health office; not an office exercising any sanitary jurisdiction over the country, but an office at which sanitary information might be collected from all quarters of the globe, and from which prompt and reliable data could be furnished to all local health offices of the movements of infectious diseases. The small annual outlay which such an establishment would cost offers an

efficient protection to the lives and property of 40,000,000 of people. Official information of the state of the yellow fever epidemic at Havana would have placed in the hands of the authorities of Savannah knowledge which would have been a power in protecting that beautiful city from the ravages of the disease.

2. Stamp out the disease in each and every instance in which it appears, after access to the continent has been gained. This is to be accomplished by the thorough disinfection of all of the excreta of such cases; the destruction of all fabrics that may become soiled with such discharges, and the employment of other hygienic measures.

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